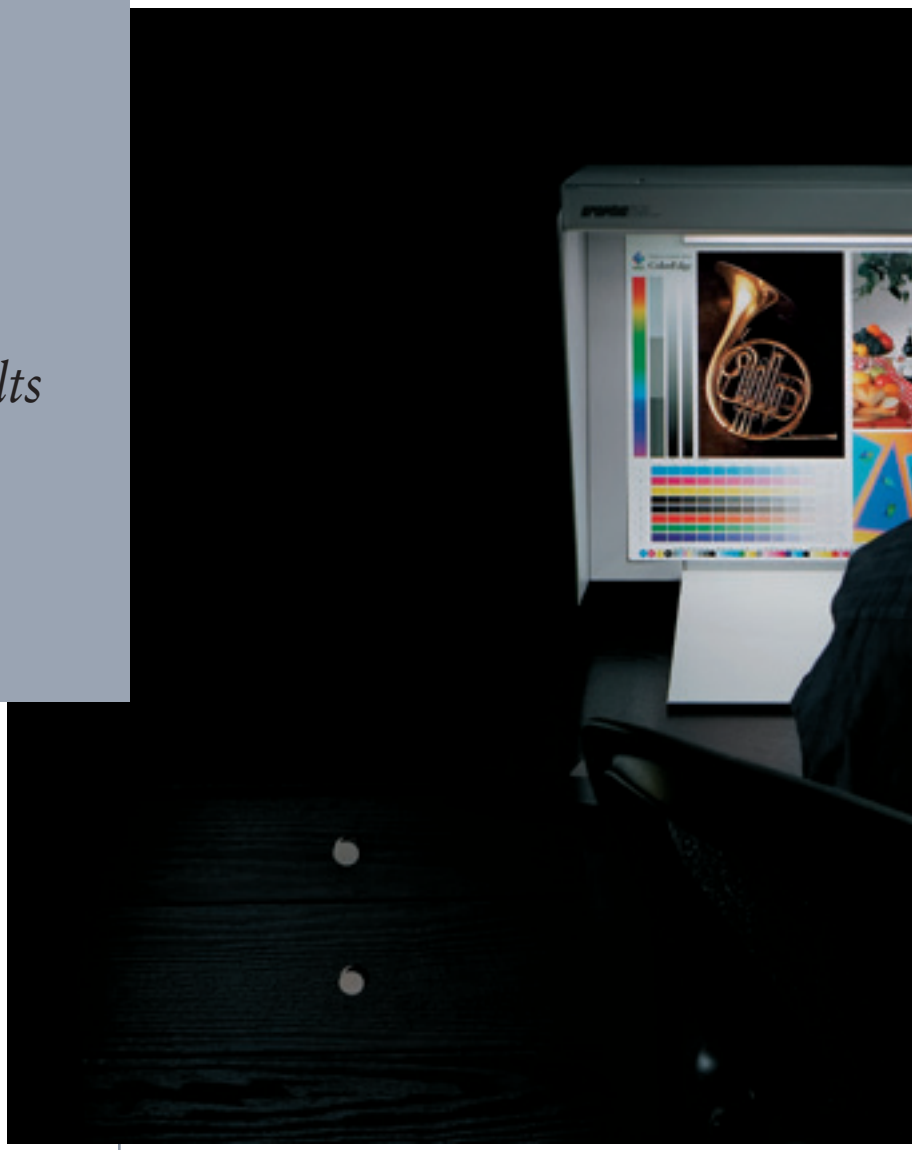
EIZO

ColorEdge

Color Calibration LCD Monitors

Color as it's meant to be

ColorEdge — perfect color results for your digital workflow



Choosing the right monitors for a color management system

The importance of color management

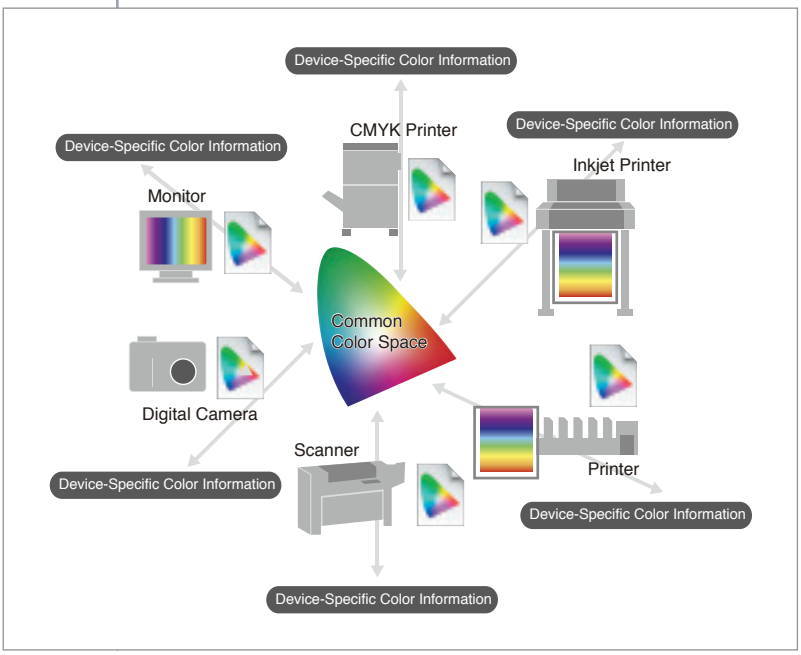
In today's digital production environment, there are many opportunities for discrepancies in color to arise along the path from the computer to the printer. This is because input devices (cameras, scanners, etc.), display devices (monitors) and output devices (various kinds of printers) may all be set to different color spaces. Such discrepancies can be avoided by employing a color management system that ensures every device in the production chain is set to a common color space.

Color management begins with the monitor

The monitor is the core of any professional color management system. If color is displayed accurately on the monitor, and color matching has been done with the output device, then you no longer have to make multiple proofs just to correct for color discrepancies. You can proof with confidence right from the start, while lowering costs, increasing efficiency and improving quality control.

ColorEdge – the right monitors for color management

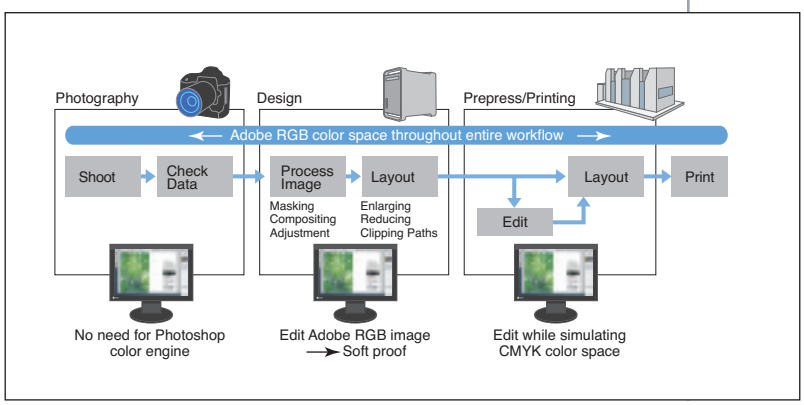
Effective color management requires monitors with accurate color reproduction and gradation characteristics. With ColorEdge monitors you get factory-adjusted gamma, extensive hardware calibration capabilities and an exceptionally wide color gamut. Their outstanding performance and reliability make them ideal for a wide range of professional environments where color reproduction is critical, including photography, graphics, printing and publishing.



Adobe RGB color space reproduction — connecting the photographer, designer, and printer

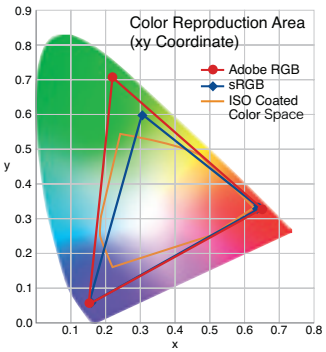
Soft Proofing with Adobe RGB

The benefits of color management quickly become apparent once a system is put into place. When all devices share a common color space, colors match at every stage of production; knowing that color is being accurately displayed naturally improves efficiency. A wide-gamut ColorEdge monitor at the center of a system using Adobe RGB as the common color space is the ideal way to ensure accurate color reproduction across all digital platforms. Such a color management environment fully supports soft proofing at every step of production, from initial photography to final printing.



Wide Color Gamut Monitors

CG301W·CG241W·CG222W·CG221



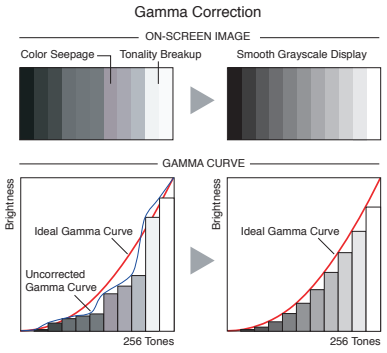
With a wide color gamut that reproduces nearly 100% of the Adobe RGB color space, these models not only cover the sRGB color space supported by many computer monitors, operating systems and digital cameras, but practically the entire ISO-coated and US web-coated CMYK color spaces used in printing as well.

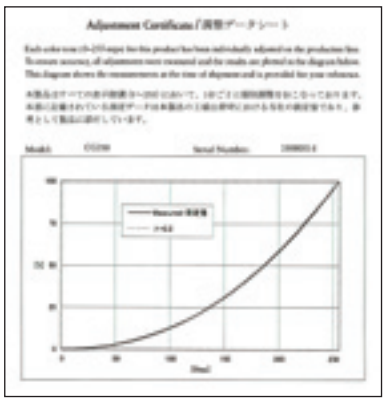
Factory Adjustment Of Gamma

The gamma level for each ColorEdge monitor is adjusted at the factory. This is accomplished by measuring the R, G, and B gamma values from 0 – 255, then using the monitor's 12-bit or 10-bit look-up table (LUT) to select the 256 most appropriate tones to achieve the desired value.

Each monitor adjusted individually at the factory. (For illustrative purposes only. Actual adjustment is performed in a darkroom.)

This is important because accurate, non-fluctuating gamma values are necessary for the proper display of color. If colors are not based on specific values and cannot be adjusted, images will be displayed differently by different monitors. ColorEdge monitors provide both precision and consistency, so graphics professionals can be sure that the final product will look exactly the way they want it to. In fact, each monitor comes with an adjustment certificate that certifies the measurement results of the gamma value.



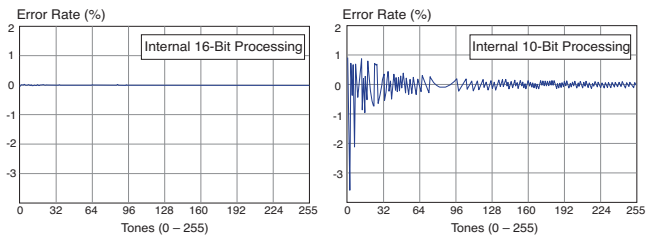


16-Bit Internal Processing

CG301W · CG241W · CG222W · CG221 · CG211

In any color-critical work, the monitor's ability to produce black is a great differentiator. With most LCD monitors, the darkest area of the screen — or black level — is usually too bright. This leads to banding and washing out of dark grays and dark colors. With 16-bit internal processing, these models not only come very close to producing a true black, but the lowest grayscale tones can be distinguished from one another for a greater level of detail in dark areas. (CG210-N and CG19 have 14-bit and 10-bit internal processing respectively.)

16-bit v. 10-bit processing

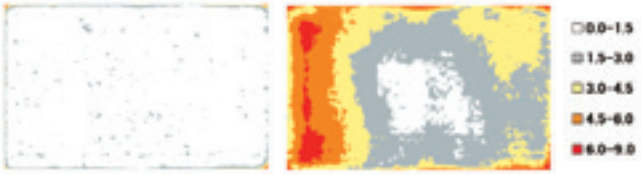


With 10-bit processing, the error rate is high in low tonal areas during calculation. With 16-bit processing, accuracy is significantly improved resulting in fewer conversion errors.

Brightness and Color Uniformity with DUE

CG301W · CG241W · CG222W · CG221 · CG211

Fluctuations in brightness and chroma on different parts of the screen are a common trait of LCD monitors. To counteract this, EIZO incorporates a Digital Uniformity Equalizer (DUE). DUE utilizes the monitor's 12-bit look-up table (LUT) with an extensive palette of 4,081 grayscale tones for each R, G, and B, and internal calculation accuracy of 16 bits to ensure a Delta-E difference of 3 or less across the screen when the monitor leaves the factory.*



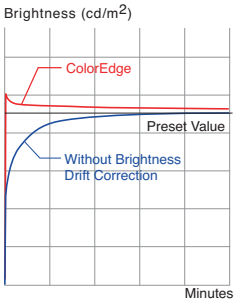
With Digital Uniformity Compensation Without Digital Uniformity Compensation

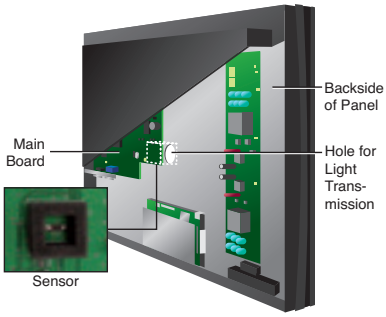
*Color-separated image with Delta-E*ab distribution across the screen of the ColorEdge CG221 (gray level 128 measured)*

**Delta-E difference for the CG301W is 5 or less along the screen perimeter.*

Short- and Long-Term Brightness Stabilization

Stable brightness is a key factor in achieving accurate color. However, fluctuations in backlight brightness normally occur from startup and can last for up to two hours. Furthermore, changes in ambient temperature can cause brightness levels to fluctuate, as can the inevitable deterioration of the backlight's fluorescent lamp over time. An EIZO patented backlight sensor incorporated in all ColorEdge monitors detects and counteracts these influences so brightness is always stable and product life is extended.





Color Vision Deficiency Simulation

CG301W · CG241W · CG222W

To accommodate the more than 200 million people worldwide with a color vision deficiency, care must be taken when choosing color schemes, otherwise important details may not be discernible. These models instantly simulate how still and moving images appear to people with red-green color vision deficiency (protanopia and deuteranopia) through internal hardware conversion and EIZO proprietary software. (Compatible with Windows Vista and XP, and with Macintosh OS X 10.3.9 or later.)

Original mode

Deuteranope mode

Simple and Precise Calibration

The EIZO-developed ColorNavigator software makes calibration both simple and accurate. Instead of having to judge colors and do time-consuming inputting, or having a specialist do it for you, all you need to do is input target values for brightness, white point and gamma. ColorNavigator works with a wide range of measurement devices to directly utilize the 12- or 10-bit LUT of ColorEdge monitors for accurate and reliable calibration in minutes.

Preset or User-Assigned Values

Preset Values

Printing and Photography/Graphic Design settings are available with default values. Just select either one and ColorNavigator will begin calibrating. Ideal for users with limited color management knowledge, this takes the guesswork out of assigning values.

User-Assigned Values

Experienced users can assign the desired values for brightness, white point, and gamma and then calibrate.

Calibration Parameters

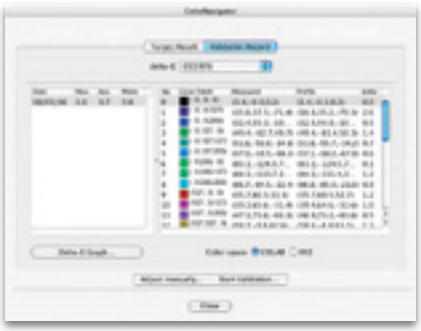
Brightness		30 cd/m²– 200 cd/m²† in 5 cd/m² increments. Setting to the monitor's minimum and maximum values is also possible.
	Black Level‡	0.2 cd/m² – 3.5 cd/m² (0.1 cd/m² increments) Setting to the monitor's minimum value is also possible.
White Point	Color Temperature	4,000 K – 10,000 K in 100 K increments
	Color Coordinates	x Value, y Value
Gamma		1.0 – 2.6 in 0.1 increments and L* ¶

† With the CG222W and CG221, it may not be possible to set the brightness to the maximum value (200 cd/m²) depending on LCD panel performance.
‡With the CG19, choosing 6-Color Adjustment after calibrating will disable the black level adjustment function, and gamma will only be adjustable from 1.8 to 2.6 in increments of 0.2.

Paper White Measurement

ColorNavigator offers a paper white measurement function for color matching between the image on your monitor and the image on your printouts. By measuring the white of the paper to be used for printing, ColorNavigator will automatically set the target values for brightness and white point accordingly.

Profile Validation



This function measures the monitor's color patches to determine the difference between the Delta-E value of the monitor's profile and the actual displayed values of the monitor. This allows for verifying the results of calibration or checking to see how much the monitor's colors have varied since it was last calibrated. The measurement results of both the monitor and profile for each color patch are indicated in either CIELAB or XYZ values, and the difference between them expressed in Delta-E. The Delta-E variation can be shown in a graph and compared with previous results

Post-Calibration Color Adjustment

Sometimes due to variations in output from different printers or the special requirements of a project, it is necessary to fine-tune an otherwise perfectly calibrated monitor to match target colors. ColorNavigator lets you easily adjust hue and saturation for all six primary and secondary colors (RGB and CMY), as well as white balance, brightness, black level and gamma, to achieve the closest possible visual match. For confirmation of calibration results or to achieve more accurate manual adjustments, a test pattern screen with a gray-scale ramp, low tones, high tones and gamma values can be displayed.

Recalibration Reminder

After initial calibration, a monitor needs to be recalibrated at regular intervals to maintain color accuracy. ColorNavigator includes a recalibration reminder that will appear after a certain number of user-determined hours. When the monitor is first calibrated, the date and time are saved. After the time you set has elapsed, an LED on the front panel lights up, and a reminder message appears the next time ColorNavigator starts up. (Not available with the CG19.)

ColorNavigator Compatible Measurement Devices

X-Rite: Eye-One Series; DTP94, DTP94B
DataColor: Spyder 2, Spyder 3

ColorNavigator System Requirements

Compatible Operating Systems*	Macintosh	Windows
	OS X 10.3.9 – 10.5	Vista (x64, x86) / XP (x64, x86)
Additional Requirements	Apple Macintosh system that fulfills Mac OS X requirements • 128 MB minimum of available RAM • Intel Mac (Mac Pro, Mac mini, MacBook, MacBook Pro, iMac) • Power Macintosh G3 (Blue White) / G4/G4 Cube/G5/Mac mini • PowerBook G3 (Bronze Keyboard or later)/G4 • eMac	
	Two or more available USB ports	

** Mac OS X 9.2.2, 10.2 – 10.3.8, and Windows 2000 can only be run on previous versions of this software except with the CG301W and CG241W which only support the operating systems listed above.*

Specifications

		ColorEdge CG301W	ColorEdge CG241W	ColorEdge CG222W
Panel Size and Type		76 cm (29.8") TFT color LCD panel	61 cm (24.1") TFT color LCD panel	56 cm (22") TFT color LCD panel
Viewing Angles (H, V)		178°, 178° (at contrast ratio of 10:1)	178°, 178° (at contrast ratio of 10:1)	178°, 178° (at contrast ratio of 10:1)
Brightness		260 cd/m² (maximum) 120 cd/m² or less (recommended[1])	300 cd/m² (maximum) 120 cd/m² or less (recommended[1])	200 cd/m² (maximum) 80 cd/m² or less (recommended[1])
Contrast		850:1	850:1	800:1
On/Off Response Time		12 ms (typical)	16 ms (typical)	16 ms (typical)
Midtone Response Time[2]		6 ms (typical)	6 ms (typical)	8 ms (typical)
Native Resolution		2560 × 1600	1920 × 1200	1680 ×1050
Active Display Size (H × V)		641.3 × 400.8 mm	518.4 x 324 mm	473.8 × 296.1 mm
Viewable Image Size		Diagonal: 756 mm	Diagonal: 611 mm	Diagonal: 558 mm
Pixel Pitch		0.2505 × 0.2505 mm	0.270 × 0.270 mm	0.282 × 0.282 mm
Gamut Coverage	sRGB	99%	98%	97%
	Adobe RGB	97%	96%	92%
Display Colors		16.77 million from a palette of 68 billion	16.77 million from a palette of 68 billion	16.77 million from a palette of 68 billion
Look-Up Table		12 bits per color	12 bits per color	12 bits per color
Internal Processing		16 bits per color	16 bits per color	16 bits per color
Screen Uniformity[3]		Center: ΔE≤3, Perimeter: ΔE≤5	Entire Screen: ΔE≤3	Entire Screen: ΔE≤3
Available Cabinet Colors		Black	Black	Black
Dot Clock		269 MHz	Analog: 202.5 MHz, Digital: 164.5 MHz	Analog: 150 MHz, Digital: 120 MHz
Scanning Frequency (H, V)	Analog	–	24 – 94 kHz, 47.5 – 86 Hz	24 – 82 kHz, 47.5 – 86 Hz
	Digital	31 – 100 kHz, 29.5 – 30.5 Hz/59 – 61 Hz (VGA Text: 69 – 71 Hz)	26 – 78 kHz, 47.5 – 63 Hz (VGA Text: 69 – 71 Hz)	31 – 65 kHz, 47.5 – 61 Hz (VGA Text: 69 – 71 Hz)
Input Terminals		DVI-D 24 pin × 2 (dual link × 1, single link [HDCP supported[4]] × 1)	DVI-I 29 pin × 2 (switchable), HDCP supported[4]	DVI-I 29 pin × 2 (switchable), HDCP supported[4]
USB Port		1 up, 2 down	1 up, 2 down	1 up, 2 down
Power Requirements		AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz	AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz	AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz
Power Consumption		170 W (maximum)	110 W (maximum)	75 W (maximum)
Power Save Mode		Less than 2 W	Less than 2 W	Less than 2 W
Height Adjustment Range		118 mm	82 mm	82 mm
Tilt / Swivel / Pivot		40° Up, 0° Down / 35° Right, 35° Left / 90°	40° Up, 0° Down / 35° Right, 35° Left / 90°	40° Up, 0° Down / 35° Right, 35° Left / 90°
Dimensions (W × H × D)		With Stand: 689 × 511.5 – 629.5 × 254.7 mm Without Stand: 689 × 450 × 90 mm	With Stand: 566 × 456 – 538 × 230 mm Without Stand: 566 × 367 × 85 mm	With Stand: 507 × 439 – 521 × 230 mm Without Stand: 507 × 333 × 74 mm
Net Weight		With Stand: 15.7 kg Without Stand: 11.2 kg	With Stand: 11 kg Without Stand: 7.4 kg	With Stand: 12 kg Without Stand: 7.7 kg
Display Mode Options		Fine Contrast (Custom, sRGB, Calibration, Emulation)	Fine Contrast (Custom, sRGB, Calibration, Emulation)	Fine Contrast (Custom, sRGB, Calibration, Emulation)
Supplied Accessories		AC power cord, signal cables (DVI-D – DVI-D, DVI-D – DVI-D [dual link supported]), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, PDF user's manual, ICC Profile), adjustment certificate, ScreenCleaner, monitor hood, quick reference, 4 screws for mount option, warranty card	AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, PDF user's manual, ICC Profile), adjustment certificate, ScreenCleaner, monitor hood, quick reference, 4 screws for mount option, warranty card	AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, PDF user's manual, ICC Profile), adjustment certificate, ScreenCleaner, monitor hood, quick reference, 4 screws for mount option, warranty card
Warranty		Five Years[1]	Five Years[1]	Five Years[1]

[1] The usage time is limited to 30,000 hours and the warranty period of the LCD panel is limited to three years from the date of purchase for all monitors in this brochure. For the CG210-N and CG19, the warranty period of the backlight is limited to three years from the date of purchase, but brightness deterioration is not covered. The warranty period of the backlight is warranted only if the monitors are used within the recommended brightness of up to and including 80 cd/m² for the CG222W; 100 cd/m² for the CG221 and CG211; 120 cd/m² for the CG301W and CG241W with the color temperature between 5,000 K–6,500 K and limited to three years from the date of purchase subject to the usage time being less than or equal to 10,000 hours. [2] Average response time measured between each grayscale level of 31, 63, 95, 127, 159, 191, and 223. [3] Measured at gray level 128 and color temperature of 5000 K. [4] Display with audio/video devices is not supported.
With current LCD technology, a panel may contain a limited number of missing or flickering pixels.

Accessories

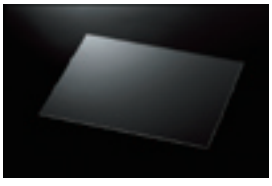
Monitor Hoods

EIZO's monitor hoods reduce screen glare and include a sliding top cover so they can remain in place when the monitor is calibrated. Sold separately for the CG210-N and CG19 and bundled with all other models.

Panel Protectors

CG241W · CG222W · CG211 · CG210-N · CG19

These protection sheets are easy to place over the screen surface, allow a minimum of 87% light transmission, and prevent dust and scratches. (Sold separately.)



ColorEdge CG221	ColorEdge CG211	ColorEdge CG210-N	ColorEdge CG19
56.4 cm (22.2") TFT color LCD panel	54 cm (21.3") TFT color LCD panel	54 cm (21.3") TFT color LCD panel	48 cm (19") TFT color LCD panel
170°, 170° (at contrast ratio of 10:1)	170°, 170° (at contrast ratio of 10:1)	170°, 170° (at contrast ratio of 10:1)	170°, 170° (at contrast ratio of 10:1)
200 cd/m² (maximum) 100 cd/m² or less (recommended[1])	225 cd/m² (maximum) 100 cd/m² or less (recommended[1])	250 cd/m²	280 cd/m²
400:1	500:1	550:1	450:1
30 ms (typical)	30 ms (typical)	30 ms (typical)	20 ms (typical)
–	–	–	–
1920 × 1200	1600 × 1200	1600 × 1200	1280 × 1024
478 × 299 mm	432 × 324 mm	432 × 324 mm	376 × 301 mm
Diagonal: 563 mm	Diagonal: 540 mm	Diagonal: 540 mm	Diagonal: 481 mm
0.249 × 0.249 mm	0.270 × 0.270 mm	0.270 × 0.270 mm	0.294 × 0.294 mm
98%	99%	99%	92%
98%	78%	78%	75%
16.77 million from a palette of 68 billion	16.77 million from a palette of 68 billion	16.77 million from a palette of 1.06 billion	16.77 million from a palette of 1.06 billion
12 bits per color	12 bits per color	10 bits per color	10 bits per color
16 bits per color	16 bits per color	14 bits per color	10 bits per color
Entire Screen: ΔE≤3	Entire Screen: ΔE≤3	–	–
Black	Gray, Black	Gray, Black	Gray, Black
Analog: 202.5 MHz, Digital: 162 MHz	Analog: 202.5 MHz, Digital: 162 MHz	Analog: 202.5 MHz, Digital: 162 MHz	Analog: 135 MHz, Digital: 108 MHz
31 – 94 kHz, 49 – 86 Hz	24 – 100 kHz, 49 – 86 Hz	24 – 100 kHz, 49 – 86 Hz	30 – 82 kHz, 49 – 86 Hz
31 – 76 kHz, 59 – 61 Hz (VGA Text: 69 – 71 Hz)	31 – 100 kHz, 59 – 61 Hz (VGA Text: 69 – 71 Hz)	31 – 100 kHz, 59 – 61 Hz (VGA Text: 69 – 71 Hz)	30 – 65 kHz, 59 – 61 Hz (VGA Text: 69 – 71 Hz)
DVI-I 29 pin × 2 (switchable)	DVI-I 29 pin × 2 (switchable)	DVI-I 29 pin × 2 (switchable)	DVI-I 29 pin × 2 (switchable)
1 up, 2 down	1 up, 2 down	1 up, 2 down	1 up, 2 down
AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz	AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz	AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz	AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz
100 W (maximum)	75 W (maximum)	75 W (maximum)	60 W (maximum)
Less than 2 W	Less than 2 W	Less than 2 W	Less than 3 W
100 mm	82 mm	82 mm	100 mm
30° Up, 3° Down / 35° Right, 35° Left / –	40° Up, 0° Down / 35° Right, 35° Left / 90°	40° Up, 0° Down / 35° Right, 35° Left / 90°	40° Up, 1° Down / 35° Right, 35° Left / 90°
With Stand: 565 × 452.5 – 552.5 × 272 mm Without Stand: 565 × 394.5 × 101 mm	With Stand: 472 × 459 – 541 × 208.5 mm Without Stand: 472 × 373 × 69 mm	With Stand: 472 × 459 – 541 × 208.5 mm Without Stand: 472 × 373 × 69 mm	With Stand: 414 × 409.5 – 509.5 × 202.7 mm Without Stand: 414 × 340 × 64 mm
With Stand: 14.5 kg, Without Stand: 10.4 kg	With Stand: 10.2 kg, Without Stand: 7.0 kg	With Stand: 10.2 kg, Without Stand: 7.0 kg	With Stand: 8.1 kg, Without Stand: 5.8 kg
Fine Contrast (Custom, sRGB, Calibration, Emulation)	Fine Contrast (sRGB, Custom, Calibration)	Fine Contrast (sRGB, Custom, Calibration)	Fine Contrast (sRGB, Custom, Calibration)
AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, HTML user's manual, ICC Profile), adjustment certificate, ScreenCleaner, monitor hood, quick reference, warranty card	AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, HTML user's manual, ICC Profile), adjustment certificate, ScreenCleaner, monitor hood, quick reference, warranty card	AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, HTML user's manual, ICC Profile), adjustment certificate, quick reference, warranty card	AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, HTML user's manual, ICC Profile), adjustment certificate, quick reference, warranty card
Five Years[1]	Five Years[1]	Five Years[1]	Five Years[1]

Screen Cleaner Kit

Keep your screen free from dust and fingerprints with this screen cleaner kit. Includes pump spray and cloth. Sold separately for the CG210-N and CG19 and bundled with all other models.

Warranty

Brightness and Color Warranty

EIZO offers a five-year warranty for all ColorEdge monitors. For most models, the backlight is warranted for three years at a brightness of up to a specific figure and color temperature from 5,000 – 6,500 K with the usage time a maximum of 10,000 hours. (See footnote 1 on page 6 for brightness figures.)

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